Ractors can't access global variables, but some special global variables should be accessed. There are several types.

**Proposal**

(1) Read-only global variables

```ruby
# process-local (readonly): other commandline parameters
'-$p' => -$p,
'-$l' => -$l,
'-$a' => -$a,

# process-local (readonly): getpid
'$$' => $$,
```

(2) Scope local variables

```ruby
# thread local: process result
'?$' => $?,

# scope local: match
'-$' => $-.inspect,
'$$$' => $$,
'-$' => $',
'\$' => $',
'\$' => $',
'\$' => $',

# scope local: last line
'$_' => $_,

# scope local: last backtrace
'-$0' => $0,
'-$!' => $!,
```

(3) Ractor local variables

```ruby
# ractor-local (derived from created ractor): debug
'$DEBUG' => $DEBUG,
'-$d' => -$d,

# ractor-local (derived from created ractor): verbose
'$VERBOSE' => $VERBOSE,
'-$w' => -$w,
'-$W' => -$W,
'-$v' => -$v,

# ractor local: stdin, out, err
'$stdin' => stdin.inspect,
'$stdout' => stdout.inspect,
'$stderr' => stderr.inspect,
```

03/21/2021
Implementation: https://github.com/ruby/ruby/pull/3670
I'll merge it soon.

**Discussion**

- only accessible from main ractor?
  - $0:
    - ARGV, ARGF, $.
- only accessible from main ractor because they will be obsolete
  - $, $/ $;
- So difficult: "$" / $LOADED_FEATURES and $:/ $LOAD_PATH

**Associated revisions**

Revision 99310e3e - 10/20/2020 06:38 AM - ko1 (Koichi Sasada)

Some global variables can be accessed from ractors

Some global variables should be used from non-main Ractors.

[Bug #17268]

```ruby
# ractor-local (derived from created ractor): debug
'$DEBUG' => $DEBUG,
'$-d' => $-d,

# ractor-local (derived from created ractor): verbose
'$VERBOSE' => $VERBOSE,
'$-w' => $-w,
'$-W' => $-W,
'$-v' => $-v,

# process-local (readonly): other commandline parameters
'$-p' => $-p,
'$-l' => $-l,
'$-a' => $-a,

# process-local (readonly): getpid
'$#' => $#,

# thread local: process result
'$?' => $?,

# scope local: match
'$-' => $-.inspect,
'$\$' => $\$,
'\$' => $',
'$\$$' => $",
'$+1' => $+1,

# scope local: last line
'$_' => $_,

# scope local: last backtrace
'$#' => $#, 
'$!' => $!,

# ractor local: stdin, out, err
'$stdin' => $stdin.inspect,
'$stdout' => $stdout.inspect,
'$stderr' => $stderr.inspect,
```

**History**

#1 - 10/20/2020 01:49 AM - ko1 (Koichi Sasada)
- Description updated

#2 - 10/20/2020 06:39 AM - ko1 (Koichi Sasada)
- Status changed from Open to Closed

Applied in changeset git|99310e3eb56fbc85bb45119285812eb959448d0c.
Some global variables can be accessed from ractors

Some global variables should be used from non-main Ractors.

[Bug #17268]

```
# ractor-local (derived from created ractor): debug
'$$DEBUG' => $DEBUG,
'$$-d' => $$-d,

# ractor-local (derived from created ractor): verbose
'$$VERBOSE' => $VERBOSE,
'$$-w' => $$-w,
'$$-W' => $$-W,
'$$-v' => $$-v,

# process-local (readonly): other commandline parameters
'$$-P' => $$-P,
'$$-I' => $$-I,
'$$-A' => $$-A,

# process-local (readonly): getpid
'$$' => $$,

# thread local: process result
'$$?' => $$?,

# scope local: match
'$$-' => $$-inspect,
'$$&' => $$&,
'$$' => $$,
'$$\' => $$

# scope local: last line
'$$_' => $$_,

# scope local: last backtrace
'$$@' => $$@,
'$$!' => $$!

# ractor local: stdin, out, err
'$$stdin' => $$stdin.inspect,
'$$stdout' => $$stdout.inspect,
'$$stderr' => $$stderr.inspect,
```

#3 - 10/22/2020 02:56 PM - Dan0042 (Daniel DeLorme)

Why can't ractors access global variables? Shouldn't it be like constants, where a frozen/shareable object can be accessed?

$x = [1,2,3]
Ractor.new{ $x }.take  # I understand that this can't work
$x = true
Ractor.new{ $x }.take  # but why is this not ok?

#4 - 10/22/2020 07:31 PM - Eregon (Benoit Daloze)

I think this issue is mostly about "special" global variables, not so much about "regular" global variables.

I wonder if "regular" global variables should be Ractor-local, or behave like constants.
Since most of the above became Ractor-local (instead of per-Process before) or a narrower scope, I think Ractor-local would make most sense.
The only special variables that are still process-local are read-only, which means it's the same as if they were Ractor-local read-only.

#5 - 10/22/2020 09:18 PM - Dan0042 (Daniel DeLorme)

Eregon (Benoit Daloze) wrote in #note-4:

I wonder if "regular" global variables should be Ractor-local, or behave like constants.

I wouldn't mind either way. Although if Ractor-local I would hope they are derived from created ractor, like $DEBUG and $VERBOSE.

#6 - 10/26/2020 04:36 PM - ko1 (Koichi Sasada)
The proposal is accepted.

I wonder if "regular" global variables should be Ractor-local, or behave like constants.

This is rejected at first by Matz (my original proposal is making all $gvars are ractor-local), to avoid confusion.